

IN THE CLAIMS:

1 1. (Currently Amended) A cross-linking compound which comprises:

2 (a) an anhydrous hydrocarbon compound liquid at ambient temperature;

3 (b) having at least one di- or poly- Group VI-A element of the periodic table of
4 elements; and

5 (c) a natural or synthetic polymer liquid at ambient temperature having a
6 molecular weight less than 25,000, wherein said anhydrous hydrocarbon compound, said Group VI-
7 A element, and said polymer are dissolvable or digestible in asphalt to react under heat of from
8 greater than 110°C to produce a cross-linked polymer modified asphalt.

1 2. (Original) A cross-linking compound as set forth in Claim 1 wherein said Group VI-

2 A element is sulfur.

1 3. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer

2 is a multi-component polymer.

1 4. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer

2 is saturated.

1 5. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer

2 contains functional groups.

1 6. (Withdrawn) A cross-linking compound as set forth in Claim 1 wherein said polymer
2 is hydroxy terminated polybutadiene.

1 7. (Original) A cross-linking compound as set forth in Claim 1 wherein said polymer
2 contains two or more chemical moieties.

1 8. (Original) A cross-linking compound as set forth in Claim 7 wherein said polymer
2 is a copolymer of butylene and butene.

1 9. (Withdrawn) A cross-linking compound as set forth in Claim 1 including aldehyde,
2 phenol, phenol-aldehyde, melamine or epoxy resins.

1 10. (Withdrawn) A cross-linking compound as set forth in Claim 9 wherein said epoxy
2 resins contains glycidyl moieties.

1 11. (Canceled)

1 12. (Currently Amended) A cross-linking compound which comprises:

2 (a) an anhydrous hydrocarbon compound liquid at ambient temperature;

3 (b) molecules or chemical moieties having two or more Group VI-A elements of
4 the periodic table of elements; and

5 (c) a natural or synthetic polymer liquid at ambient temperature having a
6 molecular weight less than 25,000, wherein said anhydrous hydrocarbon compound, said molecules
7 or moieties, and said polymer are dissolvable or digestible in asphalt to react under heat of from
8 greater than 110°C to produce a cross-linked polymer modified asphalt.

1 13. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer
2 is a multi-component polymer.

1 14. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer
2 is saturated.

1 15. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer
2 contains functional groups.

1 16. (Withdrawn) A cross-linking compound as set forth in Claim 15 wherein said
2 polymer is hydroxy terminated polybutadiene.

1 17. (Original) A cross-linking compound as set forth in Claim 12 wherein said polymer
2 contains two or more chemical moieties.

1 18. (Original) A cross-linking compound as set forth in Claim 17 wherein said polymer
2 is a copolymer of butylene and butene.

1 19. (Original) A cross-linking compound as set forth in Claim 12 wherein said Group
2 VI-A elements of the periodic table of elements are in terminal positions on the molecules or
3 chemical moieties.

1 20. (Original) A cross-linking compound as set forth in Claim 19 wherein at least one
2 of said Group VI-A elements of the periodic table of elements is sulfur.

1 21. (Original) A cross-linking compound as set forth in Claim 20 wherein the molecules
2 or chemical moieties are mercaptans.

1 22. (Original) A cross-linking compound as set forth in Claim 12 wherein said Group
2 VI-A elements of the periodic table of elements are not in the terminal position of the molecules or
3 chemical moieties.

1 23. (Original) A cross-linking compound as set forth in Claim 22 wherein said Group
2 VI-A elements of the periodic table of elements are poly-element moieties within the molecules or
3 chemical moieties.

1 24. (Original) A cross-linking compound as set forth in Claim 23 wherein at least one
2 of said Group VI-A elements is sulfur.

1 25. (Original) A cross-linking compound as set forth in Claim 23 wherein the molecules
2 or chemical moieties are Di-tert-butyl polysulfide, Di-tert-dodecyl polysulfide, Di-tert-nonyl
3 polysulfide or combinations thereof.

1 26. (Original) A cross-linking compound as set forth in Claim 23 wherein the poly-
2 element moiety is poly-sulfide.

1 27. (Withdrawn) A cross-linking compound as set forth in Claim 23 including additional
2 cross-linking agents of aldehydes, phenols, phenol-aldehydes, melamine resins or epoxy resins.

1 28. (Withdrawn) A cross-linking compound as set forth in Claim 23 wherein said epoxy
2 resin contains glycidyl moieties.

1 29. (Withdrawn) A cross-linking compound as set forth in Claim 28 wherein the glycidyl
2 moiety is neodecanoic acid, oxiranylmethyl ester.

1 30. (Withdrawn) A cross-linking compound as set forth in Claim 1 including
2 vulcanization accelerators or co-reactant.

1 31. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the
2 accelerator or co-reactant is Tetramethyl Thiuram Disulfide.

1 32. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the
2 accelerator or co-reactant is Tetrabutylthiuram Disulfide.

1 33. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the
2 accelerator or co-reactant is a room temperature accelerator or co-reactant.

1 34. (Withdrawn) A cross-linking compound as set forth in Claim 30 wherein the
2 accelerator or co-reactant is Dimethyl Cyclohexyl Ammonium Dibutyl Dithiocarbamate.

1 35. (Withdrawn) A cross-linking compound as set forth in Claim 1 including organic oils
2 or solvents.

Claims 36 through 38 (Canceled)

1 39. (Withdrawn) A cross-linking compound as set forth in Claim 35 wherein the organic
2 oils or solvents are derived from natural oils.

1 40. (Withdrawn) A cross-linking compound as set forth in Claim 39 wherein the natural
2 oils are of either animal or vegetable origin.

1 41. (Withdrawn) A cross-linking compound as set forth in Claim 39 wherein the oil is
2 of vegetable origin.

1 42. (Withdrawn) A cross-linking compound as set forth in Claim 35 wherein the organic
2 oils or solvents contain elements of Group V-A of the periodic table of elements.

1 43. (Withdrawn) A cross-linking compound as set forth in Claim 42 wherein the Group
2 V-A elements contained in said oils or solvents is either phosphorous or nitrogen or both.

1 44. (Withdrawn) A cross-linking compound as set forth in Claim 43 wherein said oils
2 or solvents containing both phosphorous and nitrogen is lecithin.

1 45. (Withdrawn) A cross-linking compound as set forth in Claim 1 which includes
2 chemical moieties capable of forming an oxidation-reduction reaction.

1 46. (Withdrawn) A cross-linking compound as set forth in Claim 45 wherein the
2 chemical moieties capable of forming a oxidation-reduction reaction are iron sulfate and iron
3 chloride.

Claims 47 and 48 (Canceled)

1 49. (Currently Amended) A cross-linking compound which comprises:
2 (a) an anhydrous hydrocarbon compound liquid at ambient temperature having
3 elemental sulfur, oxygen or selenium therein, wherein said hydrocarbon compound is Di-tert-butyl
4 polysulfide, Di-tert-dodecyl polysulfide, Di-tert-nonyl polysulfide or combinations thereof; and

5 (b) an ethylenic polymer liquid at ambient temperature having a molecular
6 weight less than 25,000, wherein said polymer is a copolymer of butylene and butene, wherein
7 said anhydrous compound having sulfur, oxygen, or selenium therein, and said polymer are
8 dissolvable or digestible in asphalt to react under heat of from greater than 110°C to produce a
9 cross-linked polymer modified asphalt.

1 50. (Original) A cross-linking compound as set forth in Claim 1 wherein said
2 anhydrous hydrocarbon compound is an organic process oil from crude or coal processing.

1 51. (Original) A cross-linking compound as set forth in Claim 12 wherein said
2 anhydrous hydrocarbon compound is an organic process oil from crude or coal processing.